UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7100

CSAH NO. 42

OVER THE

MINNESOTA RIVER

DISTRICT 7 - BLUE EARTH COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 130)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 7100, Pier 2, was found to be in good to satisfactory condition with no structurally significant defects of observed. Minor vertical cracking was observed on both faces at the center of the pier. The soundings indicated footing exposure at the upstream end of Pier 2; however, a moderate accumulation of timber debris on the channel bottom prevented the diver from confirming the presence of any footing exposure. Other than the possible footing exposure at the upstream end of Pier 2, the channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) A moderate accumulation of timber debris, with pieces up to 1 foot in diameter, was observed at the upstream end of Pier 2 extending from the channel bottom to 6 feet above the channel bottom. The soundings indicated possible footing exposure at the upstream end of Pier 2, but due to the timber debris, the diver was unable to confirm any exposure.

(B) Random areas of poor consolidation, map cracking, and areas of section loss up to 1 inch in diameter were observed at both Piers 1 and 2.

(D) A vertical crack, up to 1/8 inch wide, was observed extending from the top of the pier cap to 2 feet below the waterline on each side of Pier 2 at the midpoint.

RECOMMENDATIONS:

(B) Remove the accumulations of timber debris from the upstream end of Pier 2 to alleviate further accumulations and to prevent the possible influence of scour around the substructure unit.

(C) Because Pier 2 is founded on a spread footing and the soundings indicated footing possible exposure, closely monitor the channel bottom location until the next underwater inspection. If footing exposure exists and is progressing, countermeasures may be warranted, such as placing riprap around the exposed footing to prevent further exposure.

(D) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 7100

Feature Crossed: The Minnesota River

Feature Carried: CSAH No. 42

Location: District 7 - Blue Earth County

Bridge Description: The superstructure consists of two steel curved chord Pratt truss spans and one span of multiple steel girders. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The two abutments and Pier 1 are supported by concrete footings founded on steel piles. Pier 2 is supported by a spread footing. The piers are numbered starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: November 1, 2002

Weather Conditions: Sunny, "35EF

Underwater Visibility: "2 feet

Waterway Velocity: "0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2

General Shape: The piers each consist of two hexagonal columns with pointed ends aligned parallel to the channel flow. The columns are connected over their full height by a concrete diaphragm wall. Pier 1 is supported by a rectangular concrete footing founded on steel piles, while Pier 2 is supported by a rectangular concrete spread footing.

Maximum Water Depth at Substructure Inspected: Approximately 15 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the east end of Pier 2

Water Surface: The waterline was approximately 24.7 the below reference.
Waterline Elevation = 762.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

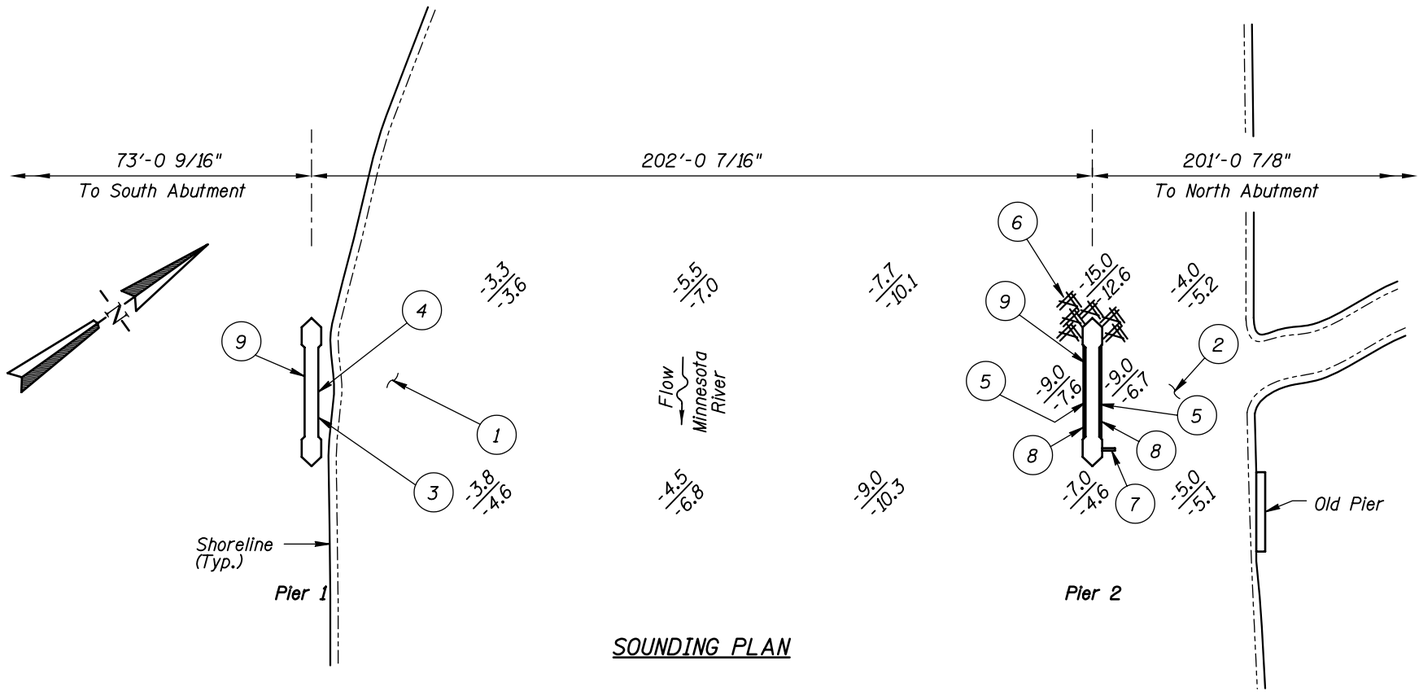
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/11/02

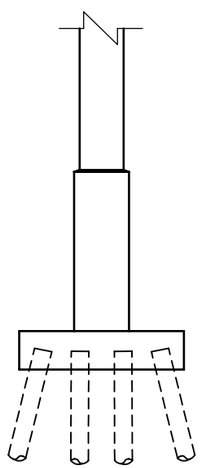
Item 113: Scour Critical Bridges: Code J/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

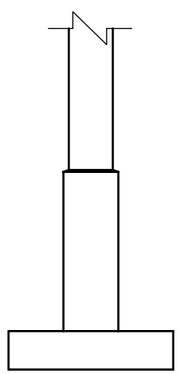
_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF PIER 1



TYPICAL END VIEW OF PIER 2

GENERAL NOTES:

1. Pier 2 was inspected underwater.
2. At the time of inspection on November 1, 2002, the waterline was located approximately 24.7 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 762.7 based on the previous report dated September 21, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of soft silty clay with up to 2 feet of probe rod penetration.

(2) The channel bottom consisted of cobbles and riprap except at the downstream nose which consisted of silty clay with up to 3 inches of penetration.

(3) Minor areas of section loss with up to a 1/2 inch penetration were observed at Pier 1 from the groundline to 5 feet above the groundline with areas of exposed reinforcing steel.

(4) A vertical crack, up to 1/8 inch wide, was observed extending from the top of the pier cap to the groundline.

(5) A vertical crack, up to 1/8 inch wide, was observed extending from the top of the pier cap to 2 feet below the waterline on each face of the pier.

(6) A moderate accumulation of timber debris, with pieces up to 1 foot in diameter, was observed at the upstream end of Pier 2 extending from the channel bottom to 6 feet above the channel bottom. Depth of water at upstream nose indicates possible footing exposure; howerver, drift precluded the confirming of any exposure.

(7) Two horizontal steel struts were observed extending from the north face of the downstream column 6 inches above the channel bottom.

(8) A 6-inch-wide step was observed five feet below the waterline extending along each face of the pier shaft between the columns at Pier 2.

(9) Random areas of poor consolidation, map cracking, and areas of section loss up to 1 inch in diameter were observed at Piers 1 and 2.

Legend

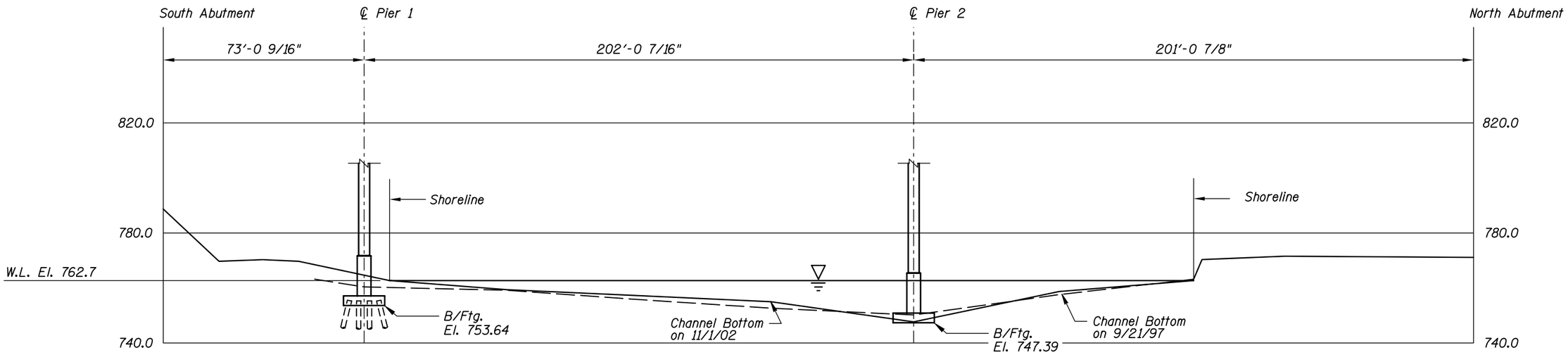
-2.0	Sounding Depth from Waterline (11/1/02)
-5.2	Sounding Depth from Waterline (9/21/97)
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

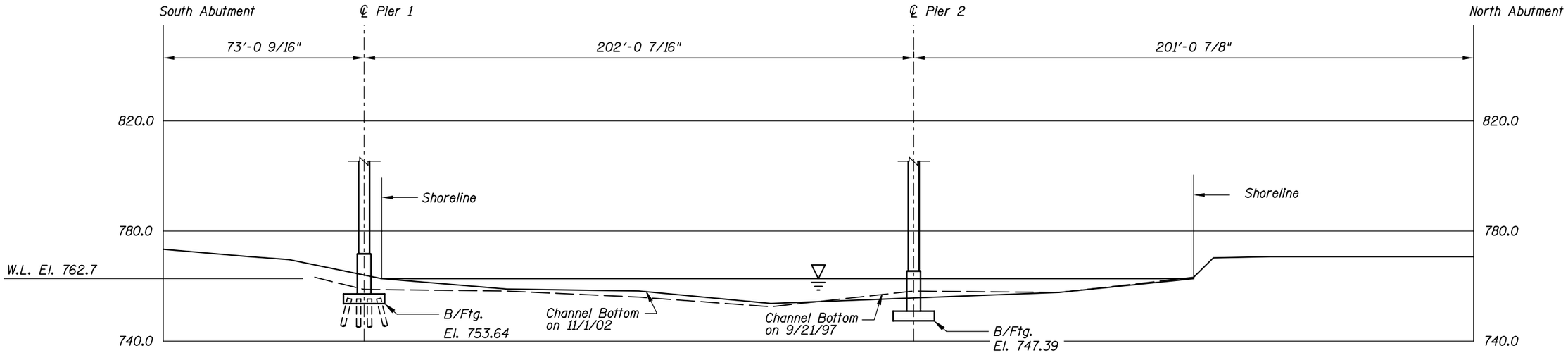
STRUCTURE NO. 7100
OVER THE MINNESOTA RIVER
DISTRICT 7, BLUE EARTH COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: NOV. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120130		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 7100
OVER THE MINNESOTA RIVER
DISTRICT 7, BLUE EARTH COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: NOV. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40'
Code: 35120130		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northwest.

Photograph 2. View of Pier 1, Looking East.

Photograph 3. View of Pier 2, Looking West.

Photograph 4. View of Pier 2, Looking East.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS Collins Engineers, Inc. DATE: November 1, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 7100 WEATHER: Sunny, "35EF

WATERWAY CROSSED: The Minnesota River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 4:30 P.M.

TIME OUT OF WATER: 4:50 P.M.

WATERWAY DATA: VELOCITY "0.5 f.p.s.
VISIBILITY "2 feet
DEPTH 15 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: The concrete at Pier 2 was generally in good condition with only minor areas of section loss and map cracking observed. Vertical cracks were also observed at the center of the pier extending from the top of the pier cap to 2 feet below the waterline with a maximum width of 1/8 inch. The soundings indicated possible footing exposure at the upstream end of Pier 2; however, a moderate accumulation of submerged timber debris on the channel bottom obstructed the diver from detecting any footing exposure. :

FURTHER ACTION NEEDED: ___X___ YES _____ NO

Remove the accumulations of timber debris from the upstream end of Pier 2 to alleviate further accumulations and to prevent the possible influence of scour around the substructure unit.

FURTHER ACTION NEEDED (CONTINUED)

Because Pier 2 is founded on a spread footing and the soundings indicated footing possible exposure, closely monitor the channel bottom location until the next underwater inspection. If footing exposure exists and is progressing, countermeasures may be warranted, such as placing riprap around the exposed footing to prevent further exposure.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7100
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Minnesota River

INSPECTION DATE November 1, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	15.0’	N	7	N	9	N	7	6	N	N	6	6	7	N	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete at Pier 2 was generally in good condition with only minor areas of section loss and map cracking observed. Vertical cracks were also observed at the center of the pier extending from the top of the pier cap to 2 feet below the waterline with a maximum width of 1/8 inch. The soundings indicated possible footing exposure at the upstream end of Pier 2; however, a moderate accumulation of submerged timber debris on the channel bottom obstructed the diver from detecting any footing exposure.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.